

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently amended): A protective coating on a silicon-containing surface, the protective coating consisting essentially of barium oxide, strontia, alumina, and silica, and incidental impurities so as to have a barium-strontium aluminosilicate composition, the protective coating having an outer surface region consisting essentially of one or more stoichiometric crystalline phases of barium-strontium aluminosilicate and being substantially free of a nonstoichiometric second crystalline phase of barium-strontium aluminosilicate that contains a substoichiometric amount of silica.

Claim 2 (Original): A protective coating according to claim 1, wherein substantially all of the protective coating consists essentially of the one or more stoichiometric crystalline phases of barium-strontium aluminosilicate and is substantially free of the nonstoichiometric second crystalline phase of barium-strontium aluminosilicate.

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

Claim 3 (Original): A protective coating according to claim 2, wherein the protective coating contains at least 47 molar percent silica.

Claim 4 (Original): A protective coating according to claim 2, wherein the protective coating consists of, by molar percent, about 25% barium oxide + strontia, about 25% alumina, about 50% silica, and incidental impurities, and strontia constitutes less than 25 molar percent of the barium oxide + strontia content of the protective coating.

Claim 5 (Original): A protective coating according to claim 1, wherein the protective coating has a silica to BaO+SrO molar ratio at or above 2:1, has an alumina content of greater than 25 molar percent, and contains up to about 2 atomic percent of an alumina phase.

Claim 6 (Original): A protective coating according to claim 1, wherein the protective coating has a second region beneath the outer surface region, the second region containing the nonstoichiometric second crystalline phase.

Claim 7 (Original): A protective coating according to claim 6, wherein the outer surface region of the protective coating contains at least 47 molar

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

percent silica and the second region of the protective coating contains less than 47 molar percent silica.

Claim 8 (Original): A protective coating according to claim 6, wherein the outer surface region of the protective coating consists of, by molar percent, about 25% barium oxide + strontia, about 25% alumina, about 50% silica, and incidental impurities, and strontia constitutes less than 25 molar percent of the barium oxide + strontia content of the protective coating.

Claim 9 (Original): A protective coating according to claim 6, wherein the outer surface region of the protective coating has a thickness of about 10 to about 25 micrometers.

Claim 10 (Original): A protective coating according to claim 1, wherein the protective coating is part of a barrier coating system on the silicon-containing surface, the barrier coating system further comprising at least one intermediate layer between the protective coating and the silicon-containing surface, the at least one intermediate layer containing a material chosen from the group consisting of silicon and mullite.

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

Claim 11 (Currently amended): A protective coating for a silicon-containing surface of a gas turbine engine component, the protective coating being a part of a barrier coating system comprising at least one intermediate layer on which the protective coating is deposited, the at least one intermediate layer containing a material chosen from the group consisting of silicon and mullite, the protective coating consisting of barium oxide, strontia, alumina, and silica, and incidental impurities so as to have a barium-strontium aluminosilicate composition consisting essentially of the stoichiometric crystalline celsian phase of barium-strontium aluminosilicate and not more than five volume percent of a nonstoichiometric crystalline lamella phase of barium-strontium aluminosilicate that contains a substoichiometric amount of silica.

Claim 12 (Original): A protective coating according to claim 11, wherein the protective coating contains at least 50 molar percent silica.

Claim 13 (Original): A protective coating according to claim 11, wherein the protective coating consists of, by molar percent, about 25% barium oxide + strontia, about 25% alumina, about 50% silica, and incidental impurities.

Claim 14 (Original): A protective coating according to claim 13,

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

wherein strontia constitutes less than 25 molar percent of the barium oxide + strontia content of the protective coating.

Claim 15 (Original): A protective coating according to claim 11, wherein the protective coating has a silica to BaO+SrO molar ratio at or above 2:1, has an alumina content of greater than 25 molar percent, and contains up to about 2 atomic percent of an alumina phase.

Claim 16 (Original): A protective coating according to claim 11, wherein the protective coating is in an as-deposited condition.

Claim 17 (Original): A protective coating according to claim 11, wherein the barrier coating system has undergone engine operation and the protective coating is substantially free of pores formed by volatilization of the protective coating.

Claims 18-40 (Canceled)

Claim 41 (New): A protective coating according to claim 1, wherein the protective coating consists of barium oxide, strontia, alumina, silica, and

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

incidental impurities.

Claim 42 (New): A protective coating according to claim 1, wherein the protective coating is in a thermal treated state and either contains sealed porosity or is substantially free of pores formed by volatilization of the protective coating.

Claim 43 (New): A protective coating according to claim 1, wherein the outer surface region of the protective coating contains not more than ten volume percent of the nonstoichiometric second crystalline phase.

Claim 44 (New): A protective coating according to claim 1, wherein the outer surface region of the protective coating contains not more than five volume percent of the nonstoichiometric second crystalline phase.

Claim 45 (New): A protective coating according to claim 1, further comprising a top coat of insulating material on the protective coating.

Claim 46 (New): A protective coating according to claim 45, wherein the insulating material is stabilized zirconia.

Application No. 10/709,288
Technology Center 1775
Amendment dated June 23, 2006
Reply to Office Action dated March 23, 2006

Claim 47 (New): A protective coating according to claim 11, further comprising a top coat of insulating material on the protective coating.

Claim 48 (New): A protective coating according to claim 47, wherein the insulating material is stabilized zirconia.